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CONTRACT CRYSTAL GROWTH
AND
FABRICATION SERVICES

Quarterly Technical Report # 5

Period: May 1990 through July 1990

Report Date: August 7, 1990

Contract Number: N00014-89-C-2222

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SUMMARY

This program is intended to give the scientists at the Naval Research Laboratory the ability to evaluate new solid state laser crystals. During the fifth quarter of this contract only one growth run was performed, the tenth since project start.

CRYSTAL GROWTH

The crystal requested and grown was Er,Tm:YAG. The melt composition is listed in Table 1. It was assumed that the distribution coefficients are unity and that the crystal composition will be the same as the melt. (JFS)

TABLE 1: Composition

<u>Growth Run</u>	<u>Melt composition</u>	<u>Nominal Doping</u> at% (cm ⁻³)
NRL-10	Y _{2.685} Er _{0.3} Tm _{0.015} Al ₅ O ₁₂	10 % Er (1.4x10 ²¹) 0.5 % Tm (6.9x10 ¹⁹)

The growth conditions are listed in Table 2. The crystal grew well and only 6 widely separated scattering sites were observed. A green fluorescence was observed with a bright fiber optic inspection light.

TABLE 2: Growth Conditions

<u>Growth Run</u>	<u>Pull Rate</u> mm/Hr	<u>Rotation</u> RPM	<u>Oxygen</u> %	<u>Average Diameter</u> mm	<u>Length at Diam</u> mm	<u>Fraction Crystallized</u> %
NRL-10	1.5	10	0.3	31	67	27

PLANS FOR NEXT QUARTER

Fabricate diode pumpable rods from NRL-10. At this time no further runs have been scheduled.

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